

A New Model in Research University Economic Development

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Societal forces

- Growing population
- Fresh water shortages
- Rising energy demand
- Global warming, environmental problems
- New diseases
- Terrorism; wars in Iraq, Afghanistan



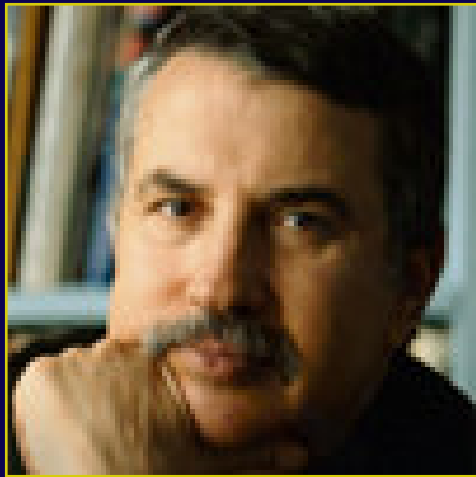


Economic forces

- Internet/high-speed communications
- Rising healthcare, education costs
- Markets have opened up
- Emergence of technology-based economies in various parts of the world
- More countries make sustained investments in higher education



Competing in the flat world



“It is now possible for more people than ever to collaborate and compete in real time with more other people on more different kinds of work from more different corners of the planet and on a more equal footing than at any previous time in the history of the world.”

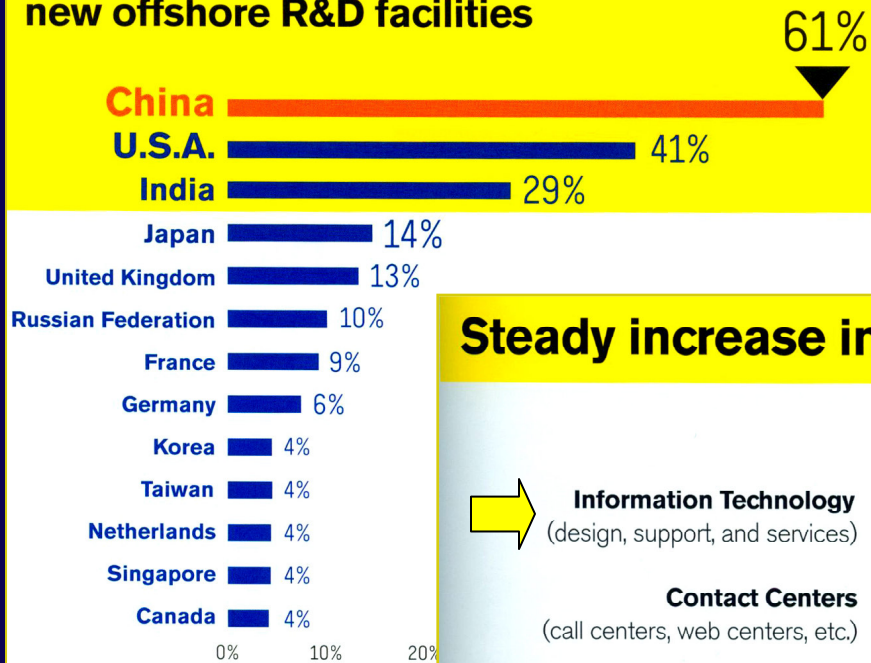
Thomas L. Friedman
The World is Flat



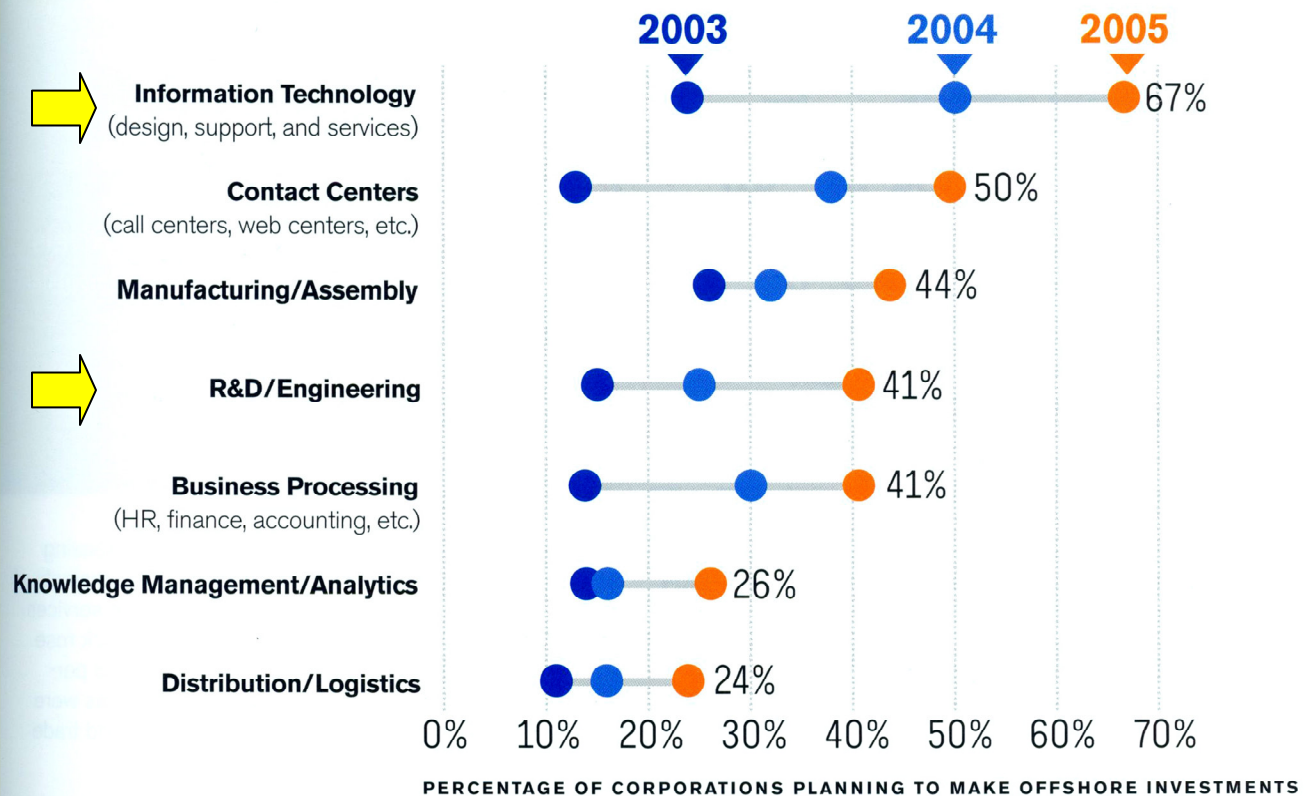
The competition grows fiercer

- Multinational R&D facilities are increasing overseas.
- The US has increased nanotechnology research funding to \$1 billion a year, but Western Europe and Japan have kept pace, and other nations are also making significant investments.
- 6 of the world's 25 most competitive IT companies are headquartered in the US; 14 are headquartered in Asia.

Most attractive choices for new offshore R&D facilities



Steady increase in offshore investments →



*Competitiveness Index:
Where America Stands*
Council on Competitiveness

The United States must learn to compete in a world in which...

- The largest technological workforces reside in other nations.
- We generate only one of four or five major inventions.
- Our wages and health care costs are higher than our global competitors.
- Our domestic market is very small compared to Asia's.



“Innovation fosters new ideas, technologies, and processes that lead to better jobs, higher wages, and a higher standard of living. For advanced industrial nations no longer able to compete on cost, the capacity to innovate is the most critical element in sustaining competitiveness.”

InnovateAmerica

National Innovation Initiative report

Innovation is critical to meeting the nation's goals:

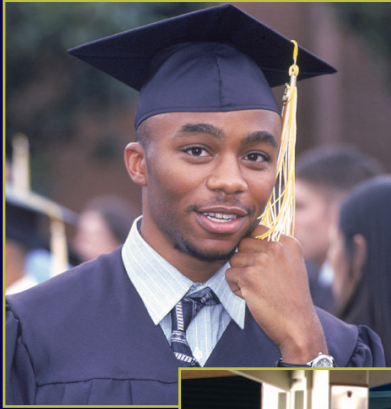
- National security
- Economic prosperity
- Environmental sustainability
- Treating and preventing illness and disease



Challenges and opportunities

- The bar for innovation is rising
 - ▷ Multi-disciplinary and complex
 - ▷ Diffusing at an increasingly rapid pace
 - ▷ Collaborative between creators and users
 - ▷ Global in scope
- Appropriate balances are more critical
 - ▷ Between competition and collaboration
 - ▷ Between security and openness
 - ▷ Between nationalism and globality
 - ▷ Between analysis and ambiguity

Universities as drivers of innovation



- Educate the talent
- Growing need to provide access
- Promote collaboration
- Conduct the fundamental research that provides discoveries, knowledge
- Enable technology transfer and commercialization

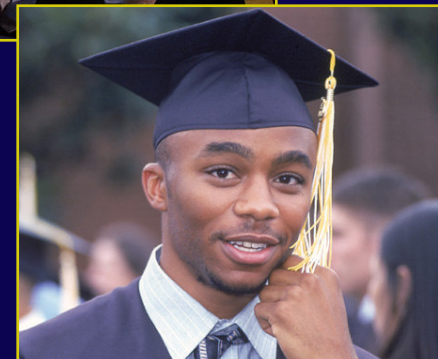
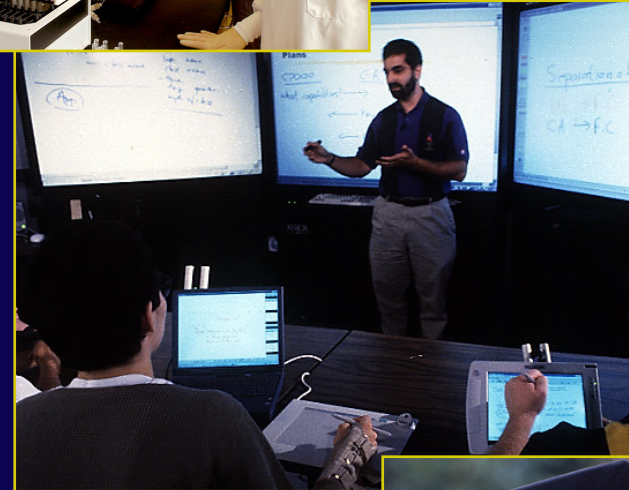
Educating the talent

“In tomorrow’s world, a nation’s wealth will derive from its capacity to educate, attract, and retain citizens who are able to work smarter and learn faster – making educational achievement ever more important both for individuals and for society at large.”

A Test of Leadership: Charting the Future of U.S. Higher Education
Report of the Spellings Commission on the Future of Higher Education

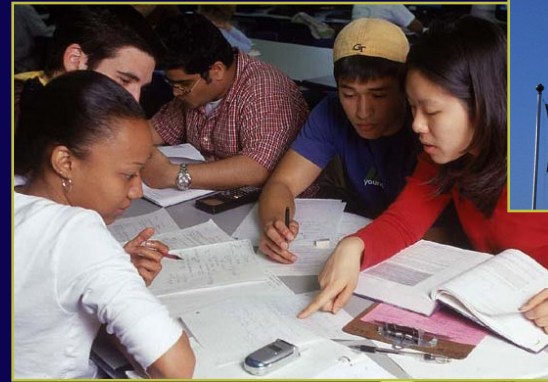
Educating students to compete

- Innovation-based, experiential learning
- IT enhancements
- Interdisciplinary teaching and learning
- Citizens of the world
- Research, open-ended questions
- Bringing minorities, women into the technology mix



Universities as drivers of collaboration

- Interdisciplinary collaboration
- IT networks
- International collaboration
- Value openness and diversity
- Open-ended discussions of the next “Big Things”



Georgia Tech International

Five campuses on three continents:



Georgia Tech Atlanta



Georgia
Tech
Lorraine



Georgia Tech
Savannah



Georgia Tech Ireland

Georgia Tech Singapore



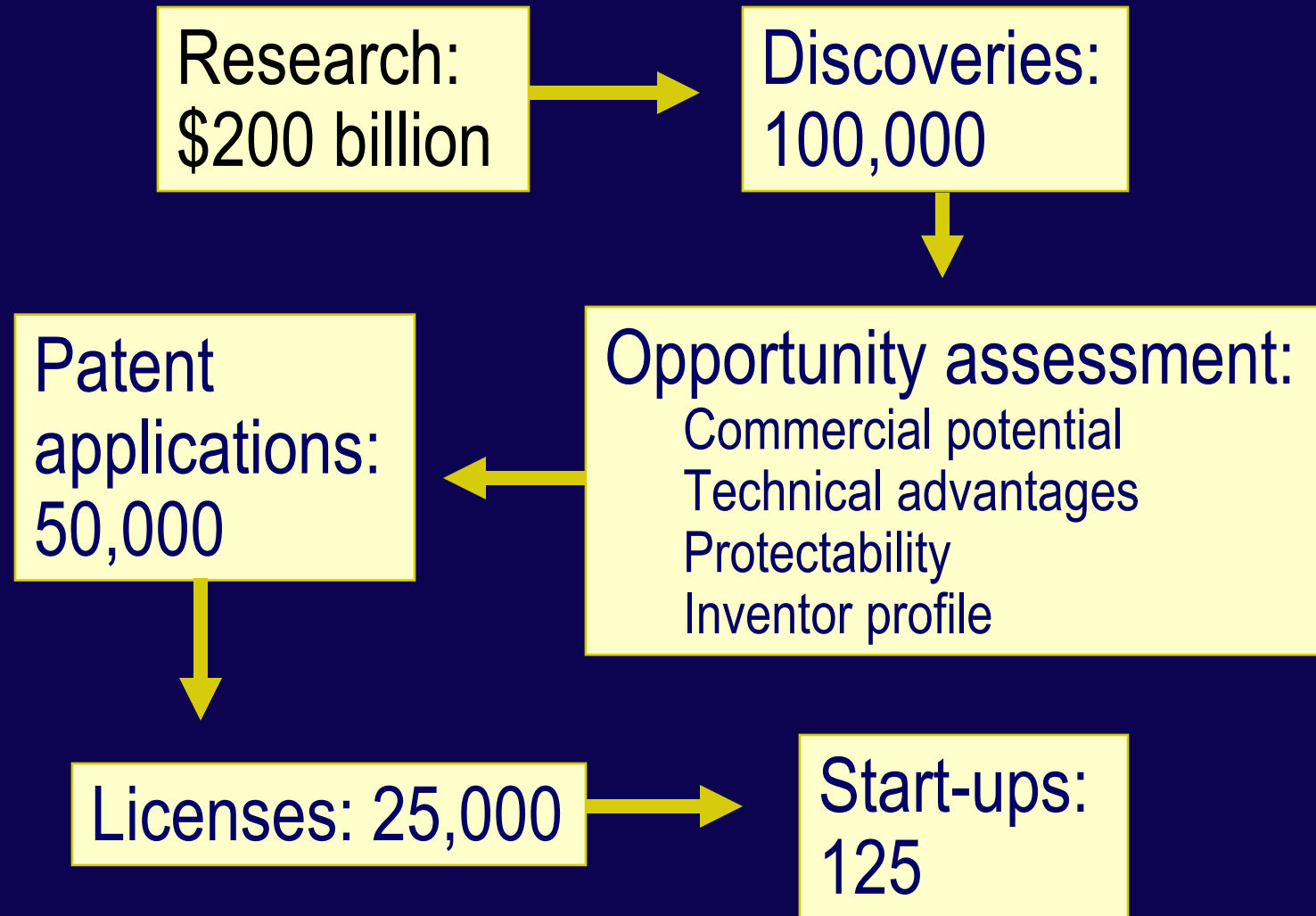
Universities as drivers of discovery

- Research universities conduct most of the nation's fundamental inquiries into the nature and principles of matter, energy and life.
- Balanced federal funding is crucial.
- Many discoveries are embryonic:
 - ▷ May be platforms for whole new lines of products, industries, lifestyles, diagnosis/treatment of disease.
 - ▷ Often require much more translational research before they can be commercialized.
 - ▷ Need IP protection, patenting, patient investors.

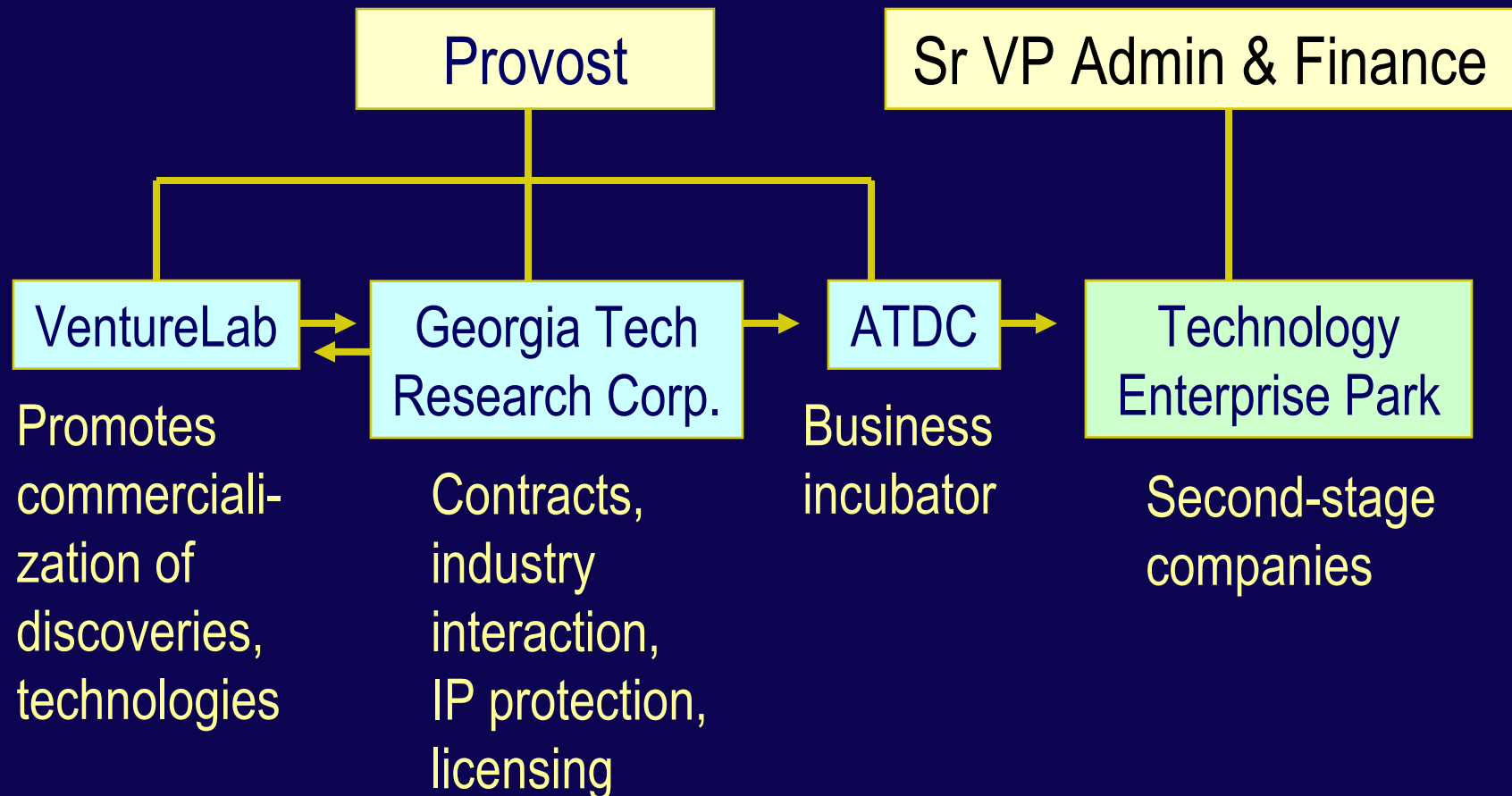
1980 Bayh-Dole Act

- Allows universities to take title to any intellectual property (IP) generated by federally funded research.
- Requires universities to:
 - ▷ Commercialize the IP they patent.
 - ▷ Ensure the IP is reasonably available for public use.
 - ▷ Alleviate health or safety concerns.
 - ▷ Share any royalties with the inventors.

Making it more productive



The Georgia Tech model



VentureLab: From lab to market

- Assesses commercial potential of discoveries, technologies in Tech research labs
- Matches faculty with “Fellows” who are experienced entrepreneurs
- Develops commercialization plans
- Provides seed funding for prototype or proof-of-concept
- 2006: evaluated 81 discoveries, technologies; 18 start-up companies in formation, which have attracted nearly \$19 million in investment.

Georgia Tech Research Corp.

- Contracting agent for sponsored research
- Protects Georgia Tech's intellectual property
- Evaluates potential licensees, negotiates license and start-up agreements, conducts "due diligence" on licensees and start-ups
- Administers research support programs



Advanced Technology Development Center

- Nation's first university-based incubator, 1980
- Widely regarded as one of the nation's best
- Wide range of companies:

Electronics
Computing/IT
Optical technology
Technical services

Manufacturing
Environmental tech
Engineering
Telecommunications

New media
Internet apps
Software
Biotechnology



Technology Square



Em
Tech
Bio



Georgia Tech
Savannah



Ford ES&T

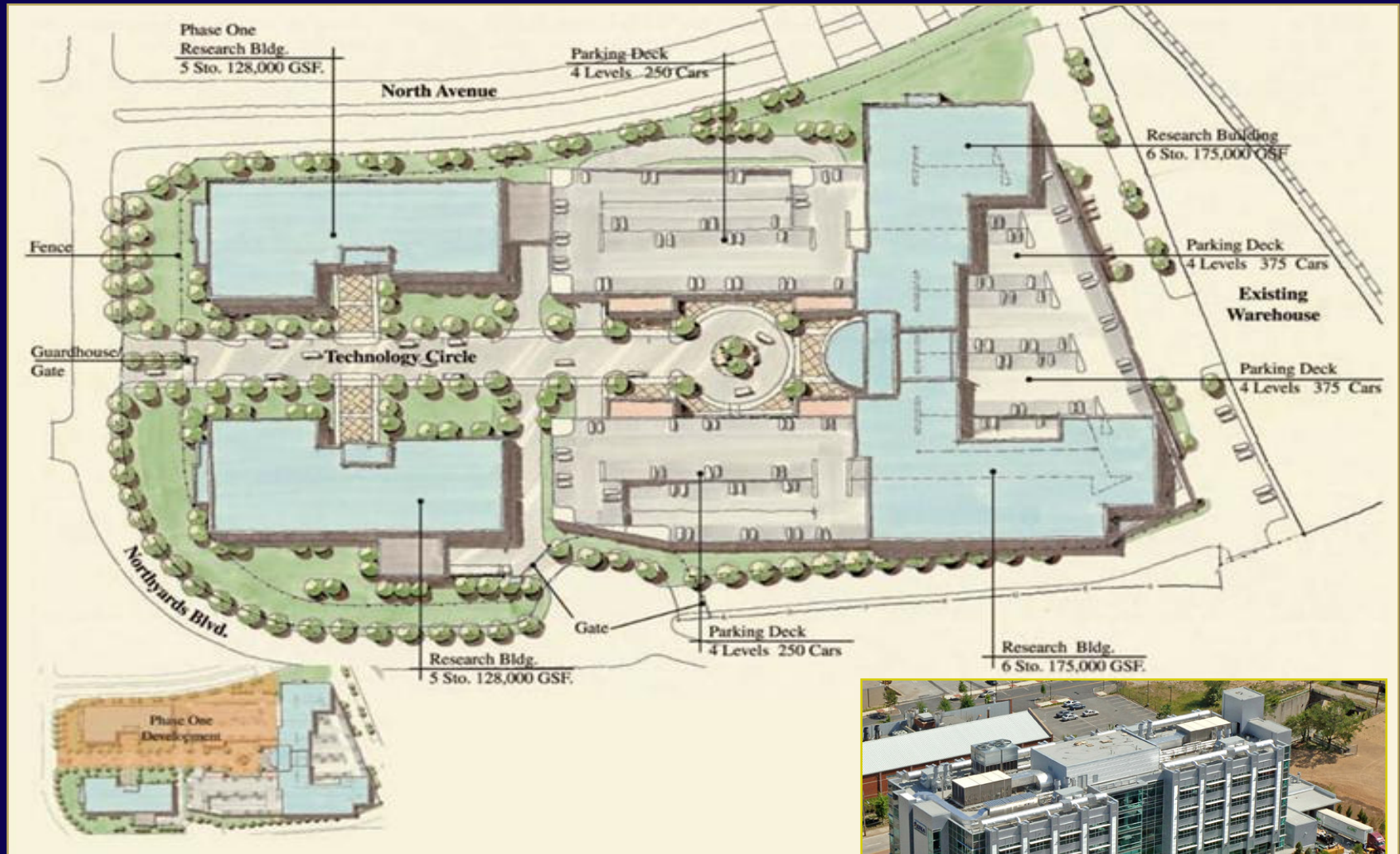


Metz, France



Columbus

Technology Enterprise Park





The CardioMEMS story

- Georgia Tech expert on MEMS (micro-electro-mechanical systems) developed a micro-sensor to measure pressure of air turbulence in jet engines on military drone aircraft.
- Collaborated with cardiologist:
 - ▷ Problem: CT scan, the only tool for ongoing monitoring of heart patients, is expensive, time-consuming, and toxic to the kidneys
 - ▷ Solution: tiny, cardiovascular sensor implanted with minimally invasive techniques; uses radio waves to report cardio output, blood pressure, and heart rate
- Authorized for use by FDA, preparing for IPO

Georgia Tech commercialization

FY 2006

- 365 invention disclosures filed
- 84 patents filed*
- 38 patents issued
- 17 software licenses**
- 10 start-ups launched

* GT “bundles” related ideas for cost-effective patenting.

** Does not include small licenses less than \$1,000.

Recognized for biotech transfer

- No. 4 in start-up companies
- No. 8 in patents filed
- No. 11 in technology transfer

*Mind to Market: A Global Analysis of University
Biotechnology Transfer and Commercialization*

A study by the Milken Institute



Orthonics

Inc. magazine: Featured Georgia Tech as one of five American research universities known for turning campus-based discoveries and technologies into start-up companies.

“The emerging global university is set to be one of the transformative institutions of the current era.”

“The Brains Business”

The Economist, September 2005